



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,261	12/05/2003	Robert R. Rice	000352-804	1178
26294	7590	08/03/2009		
TAROLLI, SUNDHEIM, COVELL & TUMMINO L.L.P. 1300 EAST NINTH STREET, SUITE 1700 CLEVEVLAND, OH 44114			EXAMINER VAN ROY, TOD THOMAS	
			ART UNIT 2828	PAPER NUMBER
			MAIL DATE 08/03/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

*Ex parte* ROBERT R. RICE and  
SAMI ALI SHAKIR

---

Appeal 2009-001005  
Application 10/729,261  
Technology Center 2800

---

Decided:<sup>1</sup> Aug. 03, 2009

---

Before LINDA M. GAUDETTE, KAREN M. HASTINGS, and  
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

---

<sup>1</sup> The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1-17 (Final Office Action, mailed Aug. 21, 2007), the only claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

#### STATEMENT OF THE CASE

Claims 1 and 5 are illustrative of the subject matter on appeal, and are reproduced from the Claims Appendix to the Appeal Brief ("App. Br."), filed Jan. 11, 2008:

1. A multimode optical fiber that favors lower order modes, the fiber comprising:

a core having a longitudinal optical axis and incorporating radially dependent amounts of dopant materials to provide a desired refractive index profile and a desired Raman gain coefficient profile that favors lower order modes and discriminates against higher order modes; and

a cladding region surrounding the core and having a refractive index different from that of the core material;

wherein light launched into an end of the fiber is subject to higher Raman gain along the optical axis, which promotes lower order modes and discriminates against higher order modes.

5. A multimode optical fiber as defined in claim 2, wherein dopant concentrations are selected to provide a measure of independent control over the refractive index profile and the Raman gain coefficient profile.

The Examiner relies on the following evidence to establish unpatentability (Examiner's Answer ("Ans."), mailed Apr. 16, 2008, 3):

Rice	6,363,087 B1	Mar. 26, 2002
Sasaoka	2002/0135866 A1	Sep. 26, 2002
Paldus	2003/0161361 A1	Aug. 28, 2003

Appeal 2009-001005  
Application 10/729,261

Clarkson et al. (Clarkson) WO 02/50964 A2 Jun. 27, 2002

Appellants request review of the following grounds of rejection (App. Br. 11):

1. claims 1-5, 12, and 13 under 35 U.S.C. § 103(a) as unpatentable over Sasaoka in view of Rice;
2. claims 6-9, 11, and 14-17 under 35 U.S.C. § 103(a) as unpatentable over Sasaoka and Rice in view of Clarkson; and
3. claim 10 under 35 U.S.C. § 103(a) as unpatentable over Sasaoka, Rice, and Clarkson, and further in view of Paldus.

*Rejection of claims 1-5, 12, and 13 under 35 U.S.C. § 103(a)  
as unpatentable over Sasaoka in view of Rice*

In addition to arguing the patentability of all claims subject to this ground of rejection on the basis of independent claim 1 (App. Br. 12-21), Appellants also identify the following groups of claims as separately patentable: (1) claims 2-5 (App. Br. 21-22); (2) claim 5 (App. Br. 22-23); and (3) claims 12 and 13 (App. Br. 23-24). We decide the patentability of these separately argued claim groupings on the basis of claims 2, 5, and 12, respectively.

Claim 1:

ISSUES

Have Appellants shown reversible error in the Examiner's finding that the dopant materials in Sasaoka's fiber core would inherently provide a Raman gain coefficient profile having the features recited in claim 1?

Have Appellants identified reversible error in the Examiner's proposed motivation for combining Sasaoka and Rice in the manner claimed?

We answer these questions in the negative for the reasons explained below.

#### FINDINGS OF FACT (“FF”)

1. Appellants’ Specification discloses an embodiment of an optical fiber in which the core “incorporates radially dependent amounts of various transparent oxides, which permits radially dependent control of the refractive index of the core material, such that a desired refractive index profile is obtained.” (Spec. [0015].) According to the Specification, “[t]he simplest example of a specific design is a graded index fiber formed by the addition of germanium oxide and no codopant. The refractive index can be controlled to form a classical radial parabolic profile.” (Spec. [0017].) Figure 2 illustrates a refractive index profile which is “approximately parabolic in shape . . . with a peak value of refractive index corresponding with the optical axis of the fiber.” (Spec. [0015].)

2. Sasaoka discloses a Raman amplification optical fiber 100 having a core region 101 doped with GeO<sub>2</sub>. (Sasaoka [0022].) The refractive index profile 150 of Sasaoka’s core region 101 is parabolic. (*See* Sasaoka [0023] and Fig. 1B.)

3. The Examiner finds that the refractive index profile 150 of Sasaoka’s core region 101 is nearly identical to the refractive index profile of Appellants’ Figure 2 refractive index profile. The Examiner further finds that because Sasaoka and Appellants use GeO<sub>2</sub> dopants in their cores, Sasaoka’s GeO<sub>2</sub> doping profile must follow the same radially dependent pattern as Appellants’. (Ans. 8-9 (citing Sasaoka ¶ [0022] and Spec. ¶¶ [0006], [0015]-[0017]).) Appellants do not dispute that a refractive index profile having a parabolic trend as shown in Sasaoka would be consistent

with a core region having a similarly patterned GeO<sub>2</sub> radial doping profile. (*See, e.g.*, Reply Brief, filed Jun. 16, 2008, 2 (“[T]he Examiner provides no evidence or support for the statement that Sasaoka *must have* a radially dependent doping profile to achieve the parabolic, non-linear refractive index profile.” (emphasis added)).)

4. According to Appellants’ Specification, incorporation of radially dependent amounts of a dopant that affects the Raman gain coefficient provides a radially dependent Raman gain coefficient profile. (Spec. [0006].) “Germanium oxide has a very large Raman gain coefficient.” (Spec. [0016].) Specification Figure 2 illustrates the parabolic-shaped Raman gain coefficient profile resulting from a radially dependent GeO<sub>2</sub> dopant profile, i.e., GeO<sub>2</sub> was incorporated in a minimum amount at the outer diameter of the core, “with a gradual transition to a maximum amount at the optical axis.” (Spec. [0016].) This Raman gain coefficient profile is described as favoring lower order modes and discriminating against higher order modes. (Spec. [0016].)

5. The Examiner finds that because Sasaoka’s GeO<sub>2</sub> doping profile follows the same pattern as Appellants’, Sasaoka’s core would likewise provide “a desired Raman gain coefficient profile that favors lower order modes and discriminates against higher order modes” as claimed in claim 1. (Ans. 9.) Appellants do not dispute that a GeO<sub>2</sub> radial doping profile following the same pattern as Sasaoka’s refractive index profile 150 would provide a Raman gain coefficient profile as recited in appealed claim 1. (*See* Reply Br. 5 (expressly stating that Appellants have not argued “that the Sasaoka refractive index profile of fig. 1b is not consistent with a

radially dependent dopant profile and the claimed Raman gain profile” (quoting Ans. 11)).)

6. Appellants argue that the Examiner’s finding with respect to Sasaoka’s Raman gain coefficient profile is contrary to Sasaoka’s express teaching that “the Raman gain coefficient  $G_R/A_{eff}$  is uniform across the diameter of the fiber.” (Reply Br. 3 (citing Sasaoka [0026]).) In other words, Appellants contend that Sasaoka does not disclose “a Raman gain  $G_R$  that is dependent on the radius of the fiber” and, therefore, would “not result in a radially dependent Raman gain profile as demonstrated in FIG. 2 of the Present Application and as recited in claim 1.” (Reply Br. 4.) In support of their interpretation of Sasaoka, Appellants rely on the disclosure of Rice, which describes “a Raman gain at every point that is also uniformly distributed” using the equation “ $(g_R \cdot P_p)/A_p$ , where  $g_R$  is the Raman gain coefficient,  $P_p$  is the pump beam power, and  $A_p$  is the cross-sectional area of the pump core” (Rice, col. 3, ll. 44-48). (Reply Br. 4-5.)

7. The Examiner disagrees with Appellants’ characterization of Sasaoka’s Raman gain coefficient as having a static value. (*See* Ans. 9.) According to the Examiner, Sasaoka describes the disclosed value for  $G_R/A_{eff}$  as “a minimum value at each wavelength for a given area.” (Ans. 9 (citing Sasaoka [0026]).) The Examiner maintains that Appellants’ interpretation of Sasaoka’s disclosure as requiring a uniform value for  $G_R$  across the diameter of the fiber is inconsistent with Sasaoka’s radially dependent doping profile. (Ans. 9; *see* FF 4-5 (evidence relied on to support a finding that Sasaoka discloses a radially dependent Raman gain profile).)

## PRINCIPLES OF LAW

“The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents.” [Id. at [419]. Instead, the Supreme Court [has] advised that “common sense” would extend the use of customary knowledge in the obviousness equation: “A person of ordinary skill is also a person of ordinary creativity, not an automaton.” [Id. at [421]. Thus, [in *KSR*,] the Supreme Court set aside any “rigid” application of the TSM test and ensured use of customary knowledge as an ingredient in that equation.

*In re Translogic Technology, Inc.*, 504 F.3d 1249, 1260 (Fed. Cir. 2007) (quoting *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398 (2007)).

[W]here the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on.

*In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997) (quoting *In re Swinehart*, 439 F.2d 210, 213 (CCPA 1971)). See also, *In re Crish*, 393 F.3d 1253, 1259 (Fed. Cir. 2004) (“[W]hen the prior art evidence reasonably allows the PTO to conclude that a claimed feature is present in the prior art, the evidence ‘compels such a conclusion if the applicant produces no evidence or argument to rebut it.’” (quoting *In re Spada*, 911 F.2d 705, 708 n.3 (Fed. Cir. 1990))); *In re Spada*, 911 F.2d at 708; *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977) (“Whether the rejection is based on ‘inherency’ under 35 U.S.C. § 102, on ‘prima facie obviousness’ under 35 U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is

evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products.”)

## ANALYSIS

Having weighed the arguments and evidence relied on by Appellants together with the Examiner’s factual findings and analysis in support of inherency, we determine that a preponderance of the evidence weighs in favor of the Examiner’s finding that the dopant materials in Sasaoka’s fiber core would inherently provide a Raman gain coefficient profile having the features recited in claim 1 for essentially those reasons expressed in the Examiner’s Answer. (*See* Ans. 4-5 and 8-12.)

Contrary to Appellants’ contention, we find that the facts and reasons relied on by the Examiner are supported by the evidence of record and provide a reasonable basis for the Examiner’s conclusion that the claimed Raman gain coefficient profile is present in Sasaoka’s core. (*See* FF 1-5.) Rice does not conclusively establish that Sasaoka’s Raman gain coefficient is uniform across the diameter of the fiber. There is no evidence to establish that the expression  $G_R/A_{eff}$  is used consistently in the art, e.g., in the manner used by Rice, that Sasaoka is using the expression in the same manner as Rice, or that the ordinary artisan would understand this equation to mean that the Raman gain profile does not vary across the diameter of the fiber. Rather, we find that the Examiner has offered an equally plausible interpretation of the express language used by Sasaoka as limiting only the minimum value of Raman gain at any given point along the diameter of the fiber. (*Compare* FF 6 *with* FF 7.)

We have also considered Appellants’ arguments in support of their contention that the Examiner failed to establish proper motivation to

combine the teachings of Sasaoka and Rice. (*See* App. Br. 18-21 and Reply Br. 6-7.) However, we are in agreement with the Examiner’s assessment of these arguments as failing to address the facts and reasons relied on by the Examiner in rejecting the claims and, therefore, unpersuasive of error in the Examiner’s obviousness determination as to claim 1. (*See* Ans. 11-12.)

**Claim 2 and Claim 12:**

In traversing the Examiner’s rejections of claims 2 and 12, Appellants merely point out what the claims recite and assert that the references fail to disclose these features. (*See* App. Br. 21-24.) 37 C.F.R. § 41.37(c)(1)(vii) expressly provides that “[a] statement which merely points out what a claim recites will not be considered an argument for separate patentability of the claim.” Accordingly, Appellants have not identified reversible error in the Examiner’s obviousness determination as to claims 2 and 12.

**Claim 5:**

**ISSUE**

The issue presented for our review is: Have Appellants identified reversible error in the Examiner’s determination that Sasaoka suggests selection of dopant concentrations to provide a measure of independent control over the refractive index profile and the Raman gain coefficient profile?

For the reasons discussed below, we answer this question in the affirmative.

Appellants argue that “the Examiner fails to demonstrate how a single dopant, as described in Sasaoka, can control the refractive index profile and the Raman gain profile *independently* with respect to each other.” (Reply Br. 7; *see also*, App. Br. 23.) The Examiner interprets claim 5 as

encompassing Sasaoka's use of a dopant profile to control both the refractive index and the Raman gain profile. (See Ans. 5 and 13.) According to the Examiner, “[a]s only the dopant profile is used to direct these two items it is believed to be a reasonable interpretation that the dopant profile is acting as an independent control.” (Ans. 13.)

The respective positions of the Examiner and the Appellants raise an issue as to the scope and meaning of claim 5. Thus, before considering the above-identified dispositive issue, we first determine whether the Examiner correctly interpreted the scope of claim 5 as encompassing a core incorporating a single dopant material. For the reasons explained below, we determine that the Examiner has applied an overly broad interpretation of claim 5.

#### FINDINGS OF FACT RELEVANT TO CLAIM INTERPRETATION

8. Appealed claim 5 recites “wherein dopant concentrations are selected to provide a measure of independent control over the refractive index profile and the Raman gain coefficient profile.”

9. The Specification includes the following disclosure regarding control of the refractive index profile and the Raman gain coefficient profile:

a. [T]he core incorporates radially dependent amounts of selected transparent oxides, to provide radially dependent control of the refractive index; and radially dependent amounts of a dopant that affects the Raman gain coefficient, to provide a radially dependent Raman gain coefficient profile.

(Spec. [0006]; *see also*, [0015].)

b. By balancing the concentrations of transparent oxides that have large Raman coefficients with those that have differential impact on the refractive index, the two profiles 20 and 22 can be independently managed within useful bounds. The precise

concentrations of dopant materials added to this graded core 12 structure are dependent on specific design goals and requirements, but would be a matter of design choice for one of ordinary skill in designing optical fibers.

(Spec. [0016].)

- c. The simplest example of a specific design is a graded index fiber formed by the addition of germanium oxide and no codopant. The refractive index can be controlled to form a classical radial parabolic profile. By using germanium oxide in this manner, the Raman gain coefficient is also being increased radially in a way that peaks on axis and thus favors Raman amplification of the lower order Stokes modes.

(Spec. [0017].)

## PRINCIPLES OF LAW

During examination, claim terms must be given their broadest reasonable construction consistent with the Specification. *In re ICON Health and Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007). “[C]laims are interpreted with an eye toward giving effect to all terms in the claim.” *Cohesive Technologies, Inc. v. Waters Corp.*, 543 F.3d 1351, 1368 (Fed. Cir. 2008) (discussing the district court’s error in reading the term “about” out of the claim) (quoting *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006)). Functional language in an apparatus claim is interpreted as requiring that the apparatus possess the capability of performing the recited function. See *Intel Corp. v. U.S. Int’l Trade Comm’n*, 946 F.2d 821, 832 (Fed. Cir. 1991).

## ANALYSIS

Having considered the language of claim 5 in light of the Specification, we determine that claim 5 requires the use of more than one

dopant to effect the recited “measure of independent control.” The Specification states that the refractive index profile and Raman gain coefficient profile are “independently managed” by “balancing the concentrations of transparent oxides.” If only one dopant is present in the core, there cannot be a balancing of concentrations. Moreover, in the embodiment in which the only dopant is germanium oxide, the refractive index is described as “controlled to form a . . . parabolic profile” while the Raman gain coefficient is described as “also being increased,” suggesting the absence of separate, or independent control.

We turn now to the dispositive issue presented in connection with claim 5. Based on our interpretation of claim 5 as requiring the use of more than one dopant to effect the recited “measure of independent control,” we are in agreement with Appellants that the Examiner reversibly erred in finding that Sasaoka discloses or suggests the invention of claim 5. As conceded by the Examiner, Sasaoka only discloses the use of a single dopant.

## CONCLUSION

Appellants have identified reversible error in the Examiner’s rejection of claim 5. Therefore, the rejection of claims 1-5, 12, and 13 under 35 U.S.C. § 103(a) as unpatentable over Sasaoka in view of Rice is reversed as to claim 5 and affirmed as to claims 1-4, 12 and 13.

*Rejection of claims 6-9, 11, and 14-17 under 35 U.S.C. § 103(a)  
as unpatentable over Sasaoka and Rice in view of Clarkson*

*and*

*Rejection of claim 10 under 35 U.S.C. § 103(a) as unpatentable  
over Sasaoka, Rice, and Clarkson, and further in view of Paldus*

Appellants rely on the same arguments presented in connection with the rejection of claim 1 in traversing the rejections of claims 6-9, 11, and 14-17 under 35 U.S.C. § 103(a) as unpatentable over Sasaoka and Rice in view of Clarkson, and claim 10 under 35 U.S.C. § 103(a) as unpatentable over Sasaoka, Rice, and Clarkson, and further in view of Paldus. (*See* App. Br. 24-31.) Appellants additionally note that Clarkson and Paldus “[do] not cure the deficiencies of” Sasaoka and Rice. (*See, e.g.*, App. Br. 26 and 31.) Appellants further attempt to traverse the rejections by pointing out what the claims recite and assert that the references fail to disclose these features.

None of these arguments are persuasive of reversible error for the reasons stated above in connection with the first ground of rejection. Accordingly, we sustain the rejections of claims 6-9, 11, and 14-17 under 35 U.S.C. § 103(a) as unpatentable over Sasaoka and Rice in view of Clarkson, and claim 10 under 35 U.S.C. § 103(a) as unpatentable over Sasaoka, Rice, and Clarkson, and further in view of Paldus.

Appeal 2009-001005  
Application 10/729,261

## CONCLUSION

Appellants have identified reversible error in the Examiner's rejection of claim 5, but have otherwise failed to persuade us of error in the Examiner's obviousness determination.

The decision of the Examiner rejecting claims 1-4 and 6-17 is affirmed. The decision of the Examiner rejecting claim 5 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(v).

AFFIRMED-IN-PART

psb/lS

TAROLLI, SUNDHEIM, COVELL & TUMMINO L.L.P.  
1300 EAST NINTH STREET, SUITE 1700  
CLEVELAND, OH 44114